MODIS/Terra and MODIS/Aqua Ocean Data Products
Goddard Earth Sciences (GES) DAAC

Level 2: (Local Scenes: 5-minute orbital swaths, 1 km)

There are 40 Ocean Color and Sea Surface Temperature (SST) and 38 Quality Control (QC) parameters (see Tables 1 and 2) defined in 6 data types. These parameters and data types are contained in 6 Level 2 data products. The ocean color and SST data products ***do not*** include latitude and longitude for each pixel. Geolocation is a separate data product (MOD03 for Terra and MYD03 for Aqua).

Ocean Color Radiance Products

This data product contains 1 data type that includes 12 parameters: Normalized water leaving radiance at 412, 443, 488, 531, 551, 667 and 678 nm, Aerosol optical thickness at 865 nm, Epsilon of aerosol correction at 765 nm and 865 nm, Aerosol model identification number (1,2), and Epsilon of clear water aerosol correction at 531 nm and 667 nm.

Ocean Color Derived Products Group 1

This data product contains 1 data type that includes 13 parameters: MODIS Chlorophyll *a* concentration for Case 1 waters, two pigment concentrations (MODIS and CZCS), three chlorophyll fluorescence parameters, a suspended solids concentration, three coccolithophore concentrations, a diffuse attenuation coefficient at 490 nm (K490), and phycourobilin and phycoerythrobilin absorptions.

Ocean Color Derived Products Group 2

This data product contains 1 data type that includes 11 parameters: an additional Chlorophyll *a* concentration for Case 1 waters using SeaWiFS algorithm, a semi-analytic Chlorophyll *a* concentration for Case 2 waters, Instantaneous Photosynthetically Available Radiation (IPAR), Absorbed Radiation by Phytoplankton (ARP), total absorptions (412, 443, 488, 531 and 551 nm), and chlorophyll and Gelbstoff absorption coefficients.

Sea Surface Temperature (SST) Products

This data product contains 1 data type that includes 2 SSTs (see the 4 SST parameters shown in Table 1): one from MODIS bands 31-32 (10.8-12.3 μm) and one from MODIS bands 22-23 (3.9-4.1 μm). Both products are computed for day and night.

Quality Control (QC) Products

The 38 MODIS QC parameters (Table 2) are divided into 2 data products (one for Ocean Color and one for SST) that contain 1 data type each. The QC products contain latitude and longitude for each pixel. These parameters (e.g., meteorological data, radiance data, brightness temperatures) are used as inputs to the ocean algorithms and atmospheric corrections.

Level 3: (Global, Binned and Mapped: Ocean Color and SST)

The 40 Ocean Color and SST (Table 1) and 35 QC (Table 2) parameters are defined by 107 data types. The 3746 data products are summarized into 4 binned and mapped functional groups.

Ocean Level 3 Binned Data Products

The 195 binned data products, which include all 40 Ocean Color and SST and part of the QC parameters (Tables 1 and 2), are divided into 10 data types. There is one binned product for each parameter. The bins are 4.63 km in an Integerized Sinusoidal Equal Area Grid (ISEAG). Land bins and bins with no data are not included. There are 4 temporal types: Daily, Weekly, Monthly and Yearly, and 2 interims daily.

Ocean Level 3 Mapped Data Products 4 km

The 1207 data products, which include all 40 Ocean Color and SST and part of the QC parameters (Tables 1 and 2), are divided into 33 data types. Data for land bins and bins with no data are included. There is one map product for each parameter. There are 8 map types: Mean (M), Standard Deviation (S), Number of Observations (N), Quality Flag (Q), Common Flag (F), Flag Byte 1, Flag Byte 2 and Flag Byte 3. Each map type has Daily, Weekly, Monthly and Yearly temporal type. The map projection for these products is cylindrical equidistant. It is strongly recommended that Quality Flags (Q) be ordered to filter the data by quality level.

Ocean Level 3 Mapped Data Products 36 km

There are 32 data types and 1172 data products. See the Ocean Level 3 Mapped 4 km data product description.

(Level 3: (Global, Binned and Mapped: Ocean Color and SST) continued)

Ocean Level 3 Mapped Data Products 1 Degree

There are 32 data types and 1172 data products. See the Ocean Level 3 Mapped 4.63 km data product description.

Level 4: (Global, binned and mapped: Primary Productivity)

The ocean primary productivity parameters (Table 3) are defined by 13 data types. There are 82 data products that have been summarized into binned and mapped functional groups. The outputs from the Behrenfeld-Falkowski and Howard-Yoder-Ryan semi-analytical models are primary productivity indices 1 and 2, respectively.

Ocean Level 4 Binned Data Products

The 4 binned data products are divided into 4 data types. The Weekly and Yearly semi-analytic data types include both indices. The third data type is Annual chlorophyll *a* concentration (C, semianalytic), and the fourth data type includes Ocean carbon primary production (P, statistical model), Export carbon production (X, statistical model), and New nitrogen production (N, statistical model). The bins are 4.63 km in an Integerized Sinusoidal Equal Area Grid (ISEAG). Land bins and bins with no data are not included. These 4 products are produced weekly.

Ocean Level 4 Mapped Data Products 4 km

The 26 data products are divided into 3 data types: weekly and yearly semi-analytical data and yearly average (statistical model) data. The weekly semi-analytical data type (8 products) includes the mean (M), the number of observations (N), and quality flag (F) products for each productivity index. It also includes PAR and mixed-layer depth, which are inputs to the weekly binned data product. The yearly semi-analytical data type (10 products) includes the M, N, and F products, plus the standard deviation (S) and number of weeks (W) used in the primary productivity index calculations. The yearly average data type (8 products) includes the mean (M) of the P, X, and N binned parameters, as well as the M, N, F, S, and W products for parameter C, the semi-analytic annual chlorophyll *a* concentration.

Ocean Level 4 Mapped Data Products 36 km

There are 3 data types and 26 data products. See the Ocean Level 4 Mapped 4.63 km data product description.

Ocean Level 4 Mapped Data Products 1 Degree

There are 3 data types and 26 data products. See the Ocean Level 4 Mapped 4.63 km data product description.

Level	*Spatial Resolution*	*Temporal Resolution*	*Size*	*File Frequency*
Level 2	1km (Local Scenes)	5-minutes	33–102 MB	144 or 288 files per day
Level 3	4.63km, 36km 1 degree (Global Maps)	Daily, Weekly, Monthly, Annually	0.1–865 MB	1-40 files per period
Level 4	4.63km, 36km 1 degree (Global Maps)	Weekly, Annually	0.3–1,360 MB	1-10 files per period

The parameters for the Ocean data products are shown on the back.

NASA Goddard Earth Sciences (GES) DAAC: http://daac.gsfc.nasa.gov/
GES DAAC Data Access: http://daac.gsfc.nasa.gov/data/
EOS Data Gateway: http://eos.nasa.gov/imswelcome/
MODIS Ocean Home page: http://modis-ocean.gsfc.nasa.gov/

* Please note that for all MODIS products "MO" is the Terra prefix and "MY" is the Aqua prefix.

MODIS/Terra and MODIS/Aqua Ocean Data Product Parameters

Goddard Earth Sciences (GES) DAAC

Table 1: Ocean Color and SST Parameters (Level 2 and 3)	
Parameter Number	**Parameter Description**
1, 2, 3, 4, 5, 6 and 7	Normalized water leaving radiance at 412, 443, 488, 531, 551, 667 and 678 nm
8	Aerosol optical thickness at 865 nm
9	Epsilon of aerosol correction at 765 and 865 nm
10, 11	Aerosol model identification number (1,2)
12	Epsilon of clear water aerosol correction at 531 nm and 667 nm
13	Chlorophyll *a* + pheopigment (fluorometric, empirical)
14	Chlorophyll *a* concentration (HPLC, empirical)
15	Total pigment concentration (HPLC, empirical)
16	Chlorophyll fluorescence line height
17	Chlorophyll fluorescence baseline
18	Chlorophyll fluorescence efficiency
19	Total suspended matter concentration in ocean
20	Pigment concentration in coccolithophore blooms
21	Detached coccolithophore concentration
22	Calcite concentration
23	Diffuse attenuation coefficient at 490 nm
24	Phycoerythrobilin concentration
25	Phycourobilin concentration
26	Chlorophyll *a* concentration (SeaWiFS analog – OC3M)
27	Chlorophyll *a* concentration (semianalytic)
28	Instantaneous photosynthetically available radiation
29	Instantaneous absorbed radiation by phytoplankton for fluorescence
30	Gelbstoff absorption coefficient at 400 nm
31	Phytoplankton absorption coefficient at 675 nm
32, 33, 34, 35 and 36	Total absorption coefficient at 412, 443, 488, 531 and 551 nm
37 (D1)	Sea surface temperature (daytime), 11 micrometer
38 (D2)	Sea surface temperature (daytime), 4 micrometer
39 (N1)	Sea surface temperature (nighttime), 11 micrometer
40 (N2)	Sea surface temperature (nighttime), 4 micrometer

The Ocean data products are shown on the front.

Table 2: Ocean Quality Control (QC) Parameters	
Parameter Number	**Parameter Description**
41, 42, 43, 44 and 45	Channel 20, 22, 23, 31 and 32 brightness temperature (daytime)
46, 47, 48, 49 and 50	Channel 20, 22, 23, 31 and 32 radiance (daytime)
51	U_Wind
52	V_Wind
53	Pressure
54	Humidity
55	Ozone
56	Latitude
57	Longitude
58	Solar Zenith
59	Solar Azimuth
60	Satellite Zenith
61	Satellite Azimuth
62*	
63	Aerosol radiance 765
64	Rayleigh radiance 443
65	Glint radiance
66	Whitecap radiance
67*	
68*	
69, 70, 71, 72 and 73	Channel 20, 22, 23, 31 and 32 brightness temperature (nighttime)
74, 75, 76, 77 and 78	Channel 20, 22, 23, 31 and 32 radiance (nighttime)
* Products unavailable	

Table 3: Ocean Primary Productivity Parameters (Level 4)	
Parameter Number	**Parameter Description**
1	Behrenfeld-Falkowski primary production index (semi-analytical model)
2	Howard-Yoder-Ryan primary production index (semi-analytical model)
P	Ocean carbon primary production (statistical model)
N	New nitrogen production (statistical model)
X	Export carbon production (statistical model)
C	Annual chlorophyll *a* concentration (semianalytic)
E	Photosynthetically available radiation
D	Mixed-layer depth

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MODIS Ocean Home page: http://modis-ocean.gsfc.nasa.gov/